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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/534,644	04/06/2006	Tsuyoshi Suda	125141-010100	6544
33717 7590 08/18/2010 GREENBERG TRAURIG LLP (L.A.) 2450 COLORADO AVENUE, SUITE 400E INTELLECTUAL PROPERTY DEPARTMENT SANTA MONICA, CA 90404				
EXAMINER				
OLSEN, KAJ K				
ART UNIT		PAPER NUMBER		
1795				
NOTIFICATION DATE		DELIVERY MODE		
08/18/2010		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/534,644

**Applicant(s)**

SUDA ET AL.

**Examiner**

KAJ K. OLSEN

**Art Unit**

1795

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 April 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4, 6-18, 20-22, 24-36, 40 and 41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 40 and 41 is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-18, 20-22 and 24-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 1/21/2010
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claim 20 is confusing because it is unclear what the claimed invention even is. For example, should the “Fail-Safe function” be interpreted as an apparatus or a method? If the claim is supposed to be an apparatus claim, then the claimed apparatus is defined entirely in terms of what applicant intends to do with the device and not in terms of what the device actually is. For example, the claim never explicitly states any particular structural element and only states that contamination of a gas shielding element “is detected” through an optical element. There is simply no structure specified in this claim. As MPEP 2114 makes clear, apparatus claims should be defined and interpreted based on the device is and not what the device does. If the claim is supposed to be a method claim, the claim also lacks clear explicit recitation of the steps of the method. For example, the claim only contains a narrative recitation of a detection of a contamination.
4. For the purpose of examination, the examiner will presume claim 20 is an apparatus claim, but clarification and correction is requested.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claim 20 is rejected under 35 U.S.C. 102(b) as anticipated by Kamiya et al (USP 4,699,509). Kamiya is being cited and relied on for the first time with this office action.

7. With respect to claim 20, the examiner is tentatively interpreting this claim as being an apparatus claim (see the 112 rejection above). Kamiya teaches a contamination detector comprising a combination of an LED 11 and a photo sensor 12 where an optical signal between the LED and the photo sensor is indicative of a level of contamination. See abstract and col. 5, ll. 34-42. With respect to this combination of LED and photo sensor being a Fail-Safe function for a gas detection system, that is only the intended use of the apparatus and the intended use need not be given further due consideration in determining patentability. Applicant does not appear to be claiming a hydrogen gas sensor or hydrogen gas shielding in claim 20, but is only specifying how the LED and photo sensor cooperate with these unclaimed elements.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1-4, 6, 9, 18, 21, 22, 24, 27, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi (US 2003/0024813) (hereafter "Taniguchi '813") in view of Nakamura et al (USP 4,024,036). Nakamura is being cited and relied on for the first time with this office action.

11. With respect to claims 1 and 2, Taniguchi '813 discloses a hydrogen sensor comprising first and second electrodes 31 and 32 and an electrolyte 11 where the first and second electrodes are made of different materials (par. 0077 and 0078) and that these different materials would inherently have different chemical potentials or absorption-dissociation properties towards hydrogen gas. In particular, Taniguchi '813 discloses that one of the electrodes can be an Al or an Al alloy while the other electrode can be a material like Pt or Pd (par. 0077). These choice of materials of Taniguchi '813 overlap the claimed materials of claims 4 and 22. The hydrogen gas detection of Taniguchi '813 is based on an electromotive force (fig. 7B and par. 0078).

Taniguchi '813 does not explicitly disclose the use of a phosphorus tungsten or molybdenum acid. However, Nakamura discloses that both phosphorus tungsten and molybdenum acids are known proton electrolytes for hydrogen sensors. See abstract; col. 1, ll. 7-12; and col. 4, l. 54 -

col. 5, l. 1. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Nakamura for the electrolyte of Taniguchi '813 because the substitution of one known proton selective electrolyte for another requires only routine skill in the art.

12. With respect to claims 3 and 21, because the materials of Taniguchi '813 overlap those the present invention (compare par. 0077 with claims 4 and 22), the electrodes of Taniguchi '813 would inherently have these properties.

13. With respect to claims 4 and 22, see par. 0077 and the discussion of claims 1 and 2 above.

14. With respect to claims 6 and 44, Nakamura also teaches that the two electrodes of a gas sensor can be on opposite sides of an electrolyte (fig. 5).

15. With respect to claims 9 and 27, see par. 0051 of Taniguchi '813 and col. 12, ll. 3-27 of Nakamura.

16. With respect to claims 18 and 36, see fig. 8 and par. 0078 and 0080 of Taniguchi '813. As to par. 0080 stating that fig. 8 is showing the current flowing, fig. 8 clearly shows that the signal is an electromotive force (i.e. voltage) and not a current as in fig. 6. See also par. 0078 where Taniguchi '813 clearly stated that the measured signal for the embodiment 3 of fig. 7B and 8 is an electromotive force sensor. Hence, Taniguchi '813's discussion of current in par. 0080 would appear to be a misprint.

17. Claims 7 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi '813 in view of Nakamura as applied to claims 1 and 2 above, and further in view of Makundan et al (US 6,656,336).

18. With respect to the claims, Taniguchi '813 and Nakamura disclose all the limitations of the claims, but Taniguchi '813 does not appear to expressly disclose that the electrodes may be arranged as rods on a substrate with an electrolyte disposed in between. However, Makundan discloses Figure 1B, a hydrocarbon sensor in which two electrodes 12 and 16 are disposed on an electrolyte 10. Electrode 16 is obvious in the shape of a rod. At the time of the invention, it would have been *prima facie* obvious to one of ordinary skill in the art to modify the electrodes of Taniguchi '813 to be rods as those of Makundan because the positioning of the electrodes yields no significant functional difference and are therefore a matter of obvious engineering choice. Although only one electrode in Makundan is actually shaped like a rod, one of ordinary skill in the art would not have difficulty discerning that the other electrode could be fashioned in the similar manner.

19. Claims 8 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi '813 in view of Nakamura as applied to claims 1 and 2 above, and further in view of Sugiyama et al (US 4,704,536).

20. With respect to the claims, Taniguchi '813 and Nakamura disclose all the limitations of the claims, but does not appear to expressly disclose that the electrodes may be arranged as concentric cylinders. However, Sugiyama discloses figure 9, a gas sensor with two co-axial electrodes 23 and 24 configured as concentric cylinders. At the time of the invention, it would have been *prima facie* obvious to one of ordinary skill in the art to modify the gas sensor configuration of Taniguchi '813 with the concentric, cylindrical electrodes in Sugiyama because the positioning of the electrodes yields no significant functional difference, and therefore concentric cylindrical electrodes are a matter of an obvious engineering choice.

21. Claims 10 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi '813 in view of Nakamura as applied to claims 2 and 9 above, and in further view of Yun et al (WO 01/89021) (hereafter "WO '021").

22. With respect to the claims, Taniguchi '813 and Nakamura disclose all the limitations of claim 9. Taniguchi '109 does not appear to expressly disclose the electrolyte comprise an internal scaffold of a material such as glass wool. However, WO '021 discloses in the abstract an electrolyte in which contains an electrospun matrix of polymeric, electrolytic material into which lithium salt-dissolved organic electrolytes are incorporated. One of the advantages of this construction as outlined by WO '021 is a "good mechanical strength." At the time of the invention, it would have been *prima facie* obvious to one of ordinary skill in the art to modify the electrolyte of Taniguchi '813 and Nakamura with an internal matrix like WO '021 because one would wish to take advantage of the improved mechanical strength such a construction would offer.

23. Claims 11-16 and 29-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi '813 in view of Nakamura as applied to claims 1 and 2 above, and further in view of Christen et al (USP 4,390,869).

24. With respect to claims 11-13 and 29-31, Taniguchi '813 and Nakamura teach a hydrocarbon sensor with all the limitations of claims 1 and 2. The preambles for each claim (e.g. "a hydrogen gas leak controlling system" or "a hydrogen gas leak information transmitting system," etc.) are not structurally limiting and have not been given patentable weight. Taniguchi '813 does not expressly teach that a voltage comparator be used in the apparatus. However, Christen teaches a gas sensing signaling system. In particular, Christen teaches figure 7 which

includes three comparators 101/1, 101/2, 101/3. These are voltage comparators (col. 12, lines 21-33). At the time of the invention, it would have been *prima facie* obvious to one of ordinary skill in the art to include a voltage comparator like that from Christen in the apparatus of Taniguchi '813 because of the necessary advantages of doing so, such as eliminating false alarms or alarms for negligible concentrations of gas.

25. With respect to claims 14-16 and 32-34 (those limitations not covered above), Christen teaches the use of Schmitt triggers to distinguish between warning signals and alarm signals (col. 15, lines 32-43).

26. Claims 17 and 35 are rejected under 35 U.S.C 103(a) as being unpatentable over Taniguchi '813 in view of Nakamura as applied to claims 1 and 2 above in view of Maki et al (US 2004/0026268).

With respect to the claims, Taniguchi '813 and Nakamura teaches all the limitations of the claims, but does not expressly teach that there be a plurality of hydrogen gas sensors arranged on the same substrate. However, Maki teaches an apparatus which is an electromotive force type gas sensor comprising a substrate and a gas sensor on that substrate (Maki, claim 1). Further, Maki teaches a claim 8 drawn to an electromotive force gas sensor with two or more electromotive force gas sensors on the same substrate. At the time of the invention, it would have been *prima facie* obvious to those of ordinary skill in the art to provide a plurality of gas sensors like in Taniguchi '813 on the same substrate like in Maki because of the versatility such a configuration would have, such as the ability to allow for failure of some gas sensors without failure of the whole apparatus as well as the ability to possibly discern a target gas profile or concentration gradient.

***Allowable Subject Matter***

27. Claims 40 and 41 are allowed.
28. The reasons for the allowance of claims 40 and 41 can be found in the 1/15/2010 office action and will not be reiterated here.

***Response to Arguments***

29. Applicant's arguments with respect to the rejected claims have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KAJ K. OLSEN whose telephone number is (571)272-1344. The examiner can normally be reached on M-F 6:00-2:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kaj K Olsen/  
Primary Examiner, Art Unit 1795

August 13, 2010